

**REMARKS**

**I. Status of Claims**

Claims 14-15 and 17-28 are pending. By the present amendment, without prejudice or disclaimer, claim 14 has been amended to incorporate the subject matter of claim 16 and some of the subject matter of claim 19. Hence, claim 16 has been cancelled and claims 19 and 20 amended. Applicants further amended claim 24 to correct its dependency and claims 25, 26, and 28 to improve their clarity. Exemplary support for the amendments can be found throughout the specification, such as page 4, lines 19-23, and the claims as originally filed. Accordingly, Applicants submit that the amended claims have full Section 112 support and thus, no new matter has been added by these amendments.

**II. Claim Objection**

The Office has objected to the dependency of claim 24. See Office Action at 2. Applicants have amended claim 24 to depend on claim 23, as suggested by the Office. Accordingly, Applicants respectfully request the withdrawal of this objection.

**III. Rejection Under 35 U.S.C. § 112**

The Office rejected claims 15, 21, 22, 24, 25, 26, and 28 under 35 U.S.C. § 112, second paragraph, as indefinite for reasons disclosed at pages 2-3 of the Office Action. While Applicants respectfully disagree and submit that these claims are definite, in order to advance prosecution Applicants have amended claims 14 and 28. Accordingly, Applicants submit that the rejections identified by the Office have been rendered moot

and respectfully request the withdrawal of the rejections of claims 15, 21, 22, 24, 25, 26, and 28 under 35 U.S.C. § 112, second paragraph.

#### **IV. Rejections Under 35 U.S.C. § 102**

The Office rejected claims 14, 15, 19, 21, 22, 24, and 26 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Application Publication No. 2003/0024278 A1 ("Berkey"). See Office Action at 3-6. The Office has also rejected claim 25 as anticipated or, in the alternative, under 35 U.S.C. § 103(a) as being obvious over Berkey. See Office Action at 7-8. Applicants respectfully disagree and traverse these anticipation rejections. However, in order to advance prosecution, Applicants have amended independent claim 14 to recite the limitations of claim 16, which was not identified as anticipated by the art. Accordingly, Applicants submit that the rejections identified by the Office have been rendered moot and respectfully request the withdrawal of the rejections of claims 14, 15, 19, 21, 22, 24, 25, and 26 under 35 U.S.C. § 102(e).

#### **V. Rejections Under 35 U.S.C. § 103**

The Office has rejected claim 25 as anticipated or, in the alternative, under 35 U.S.C. § 103(a) as being obvious over Berkey. See Office Action at 7-8. The Office also rejected claims 16 and 17 under 35 U.S.C. § 103(a) as being obvious over Berkey in view of U.S. Patent No. 4,684,383 to Cavender, Jr. ("Cavender"). See *id.* at 8-10. The Office further rejected claims 18, 20, 23, 27, and 28 under 35 U.S.C. § 103(a) as

being obvious over Berkey. *See id.* at 10-15. Applicants respectfully disagree and traverse these obviousness rejections.

With respect to obviousness, several basic factual inquiries must be made in order to determine the obviousness or non-obviousness of claims under 35 U.S.C. § 103. These factual inquiries, set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 U.S.P.Q. 459, 467 (1966), require the Examiner to:

- (1) Determine the scope and content of the prior art;
- (2) Ascertain the differences between the prior art and the claims in issue;
- (3) Resolve the level of ordinary skill in the pertinent art; and
- (4) Evaluate evidence of secondary considerations.

The obviousness or nonobviousness of the claimed invention is then evaluated in view of the results of these inquiries. *Graham*, 383 U.S. at 17-18, 148 U.S.P.Q. at 467; *see also KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1730, 82 U.S.P.Q.2d 1385, 1388 (2007).

At a minimum, Applicants submit that the Office cannot establish (1) that the cited references teach or suggest each and every element recited in the claims and (2) that some suggestion or motivation exists either in the references themselves, or in the knowledge generally available to one of ordinary skill in the art, to combine the references to achieve the presently claimed invention. *See* M.P.E.P. §§ 2143.01 & 2143.03.

**A. Berkey, Alone or in Combination with Cavender, Fails to Teach Each and Every Element of the Pending Claims**

As the Office recognized, Berkey fails to teach or suggest “the specific claimed diameters of the central hole at the end of the drying and consolidating step.” Office Action at 8-9. The Office nonetheless argues that Berkey “discloses the central hole diameter as a result-effective variable that may be altered . . . for the benefit of producing an improved final optical product.” Office Action at 9. Applicants respectfully disagree. In order for a variable to be considered result-effective, it is not enough for a reference to recognize the existence of a variable, rather the reference must recognize that *manipulating* the variable “achieves a recognized result.” M.P.E.P. § 2144.05(II)(B).

Applicants discovered the importance of the diameter of the central hole at the end of the drying and consolidating step is between 0.055 mm and 0.40 mm. In fact Applicants discovered that this range is a result of competing causes of fiber attenuation. First, the lower the diameter at the end of the drying and consolidating step, the higher is the amount of internal defects in the fiber core, resulting in higher fiber attenuation. Second, the higher the diameter at the end of the drying and consolidating step, the higher is the amount of water and/or OH<sup>-</sup> content that could rewet, resulting in higher fiber attenuation. Hence, it is insufficient to simply recognize the value of having a higher or lower diameter at the end of the drying and consolidating step, since being either too small or too great yields a negative result, high fiber attenuation.

In contrast, Berkey merely discloses a process, which includes the reduction of a centerline aperture. Berkey at ¶¶0018]. Berkey explains that “[i]f the preform 100 has a sufficiently small nominal inside diameter and if the preform is raised to a high enough temperature, the centerline region of the preform may finally fully collapse upon itself without the assistance of vacuum and/or without the assistance of pulling or drawing upon one or more ends of the preform.” *Id.* at ¶¶0114]. Alternatively, “if the nominal inner diameter is relatively large, the application of a vacuum to the centerline aperture, and/or the application of a pulling force on one or more ends of the preform may be desirable . . . or may even be necessary to close the hole.” *Id.* at ¶¶0115]. In contrast to a plethora of other variables, Applicants have identified no teaching regarding the range of aperture size before or after these reduction processes. Having identified the two mechanisms to achieve reduction of the central aperture, Berkey has no concern, let alone appreciation, of the significance of the hole diameter value at the end of the drying and consolidating step. Berkey fails to teach, much less suggest, too narrow a hole is associated with fiber attenuation due to internal defects or that too wide a hole is associated with fiber attenuation due to the water and/or OH<sup>-</sup> content in the central hole. Thus, Berkey does not teach central hole diameter as a result-effective variable.

The Office states that Cavender “teaches that the geometry of the central hole is a known parameter related to water, or OH<sup>-</sup>, contamination.” Office Action at 9. Cavender does not disclose Applicants’ claimed range of central hole diameter, but the Office states that Cavender recognizes central hole diameter as a result-effective variable. Applicants respectfully disagree. The Office states that Cavender uses diameter in a calculation of average water content, see Office Action at 10, yet nowhere

does Cavender disclose that modifying the central hole diameter could achieve the result of reducing fiber attenuation by decreasing water content. Cavender uses temperature and vacuum to decrease water content, and does not recognize that certain values of central hole diameter at the end of the drying and consolidating step can actually prevent rewetting of the central hole after consolidation. Cavender, col. 6. Hence, Cavender does not recognize hole diameter as a result-effective variable that can be manipulated; it is simply a variable that is a given. In fact, Cavender teaches that “stretching the blank into a fiber does not change the average water content of the fiber.” Cavender at col. 7, lines 29-33.

Since neither Berkey nor Cavender recognizes that central hole diameter at the end of the drying and consolidating step affects *both* internal defects in the fiber core *and* water contamination, neither Berkey nor Cavender appreciates there is a trade-off between the two effects, and thus optimization of central hole diameter is not possible without balancing both goals. Because neither Berkey nor Cavender discloses Applicants’ claimed range of central hole diameters or teaches this diameter as a result-effective variable, the present invention is non-obvious over the disclosure of Berkey in view of Cavender.

**B. The Office Has Not Shown Motivation to Modify Berkey in View of Cavender**

Applicants respectfully submit that in light of the differences between the processes disclosed in Berkey and Cavender, there is no motivation to combine these references. First, a person skilled in the art would recognize that Cavender offers nothing to the teachings of Berkey. It is simply irrelevant whether Cavender “teaches that the geometry of the central hole is a known parameter related to water, or OH<sup>-</sup>,

contamination.” See Office Action at 9. Berkey already teaches that the application of heat at even higher temperatures (Berkey at ¶¶ [0023],[0034], [0086], [0132]) and the application of vacuum to the central aperture removes removes contaminants such as water (and hence OH-). Berkey at ¶ [0090]. Berkey even teaches the use of dry inert or drying gasses to achieve the same result as Cavender. *Id.* Hence, since Berkey already teaches the process of Cavender, there is no identified motivation to combine any other teachings of Cavender to Berkey.

Second, Berkey and Cavender attempt to solve different problems. Berkey seeks to decrease polarization mode dispersion by reducing internal defects in the fiber core, whereas Cavender attempts to decrease fiber attenuation by reducing water content in the fiber. One of ordinary skill in the art would not look to Cavender's disclosure regarding fiber attenuation in order to modify the process disclosed in Berkey.

Third, it is an object of Cavender “to provide methods for reducing water content which do not involve sealing the ends of the blank.” Cavender at col. 2, lines 62-65. Berkey, on the other hand, discloses a method in which the soot core blank “is preferably fitted with a glass bottom plug” and in which the core blank “may be closed by inserting a top plug into [the] centerline aperture.” Berkey at ¶ [0082]. In light of these differences, one of ordinary skill in the art would not be motivated to modify Berkey in view of Cavender.

**VI. Conclusion**

In view of the foregoing amendments and remarks, Applicants respectfully request reconsideration of this application and the timely allowance of the pending claims.


If the Examiner believes a telephone conference could be useful in resolving any outstanding issues, she is respectfully invited to contact Applicant's undersigned counsel at (202) 408-4275.

Please grant any extensions of time required to enter this response and charge any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

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